

FIG. 1

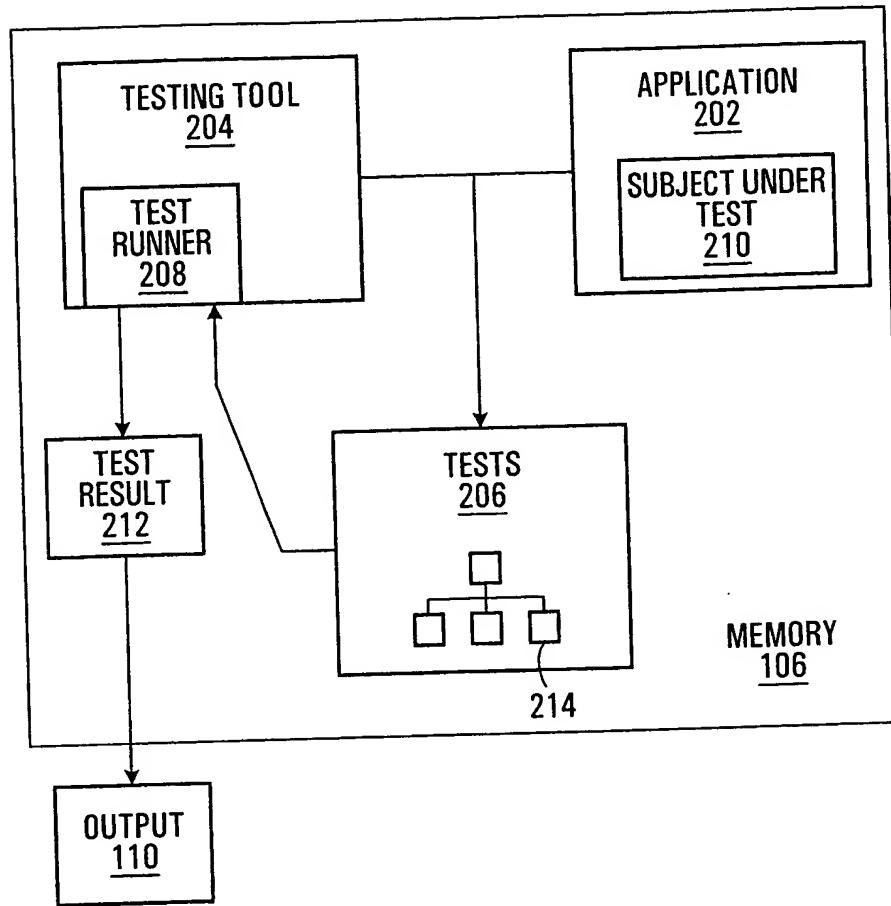


FIG. 2

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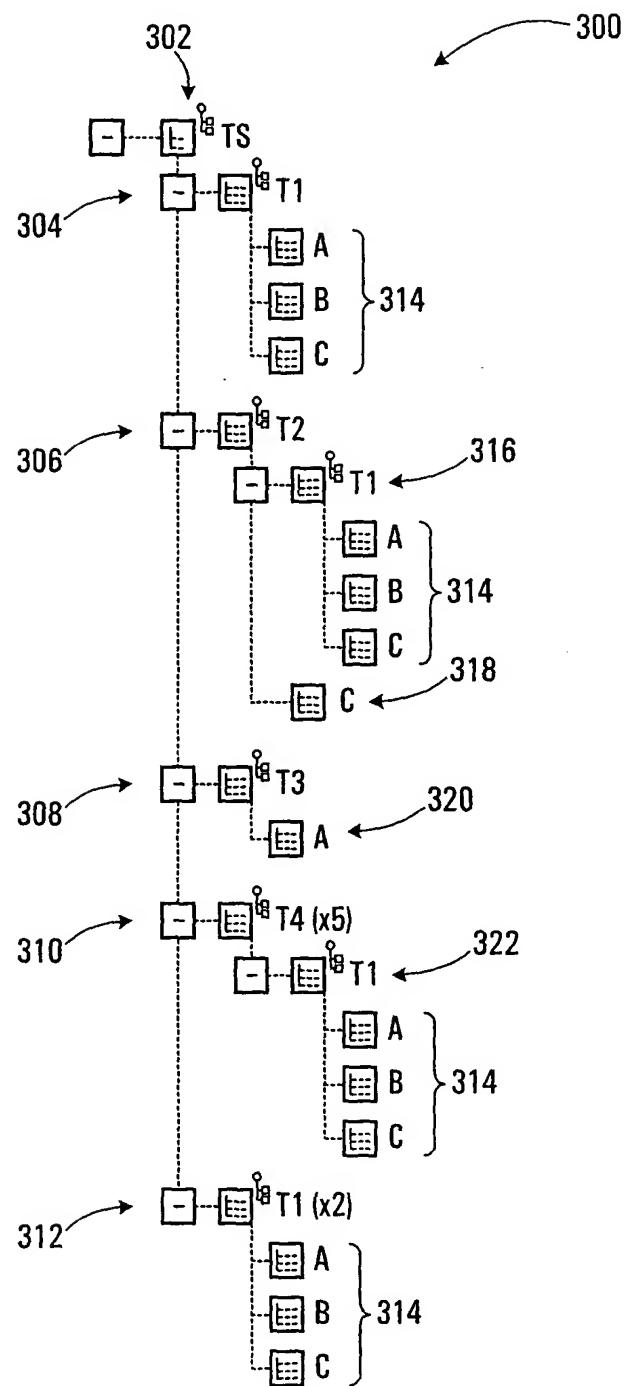


FIG. 3

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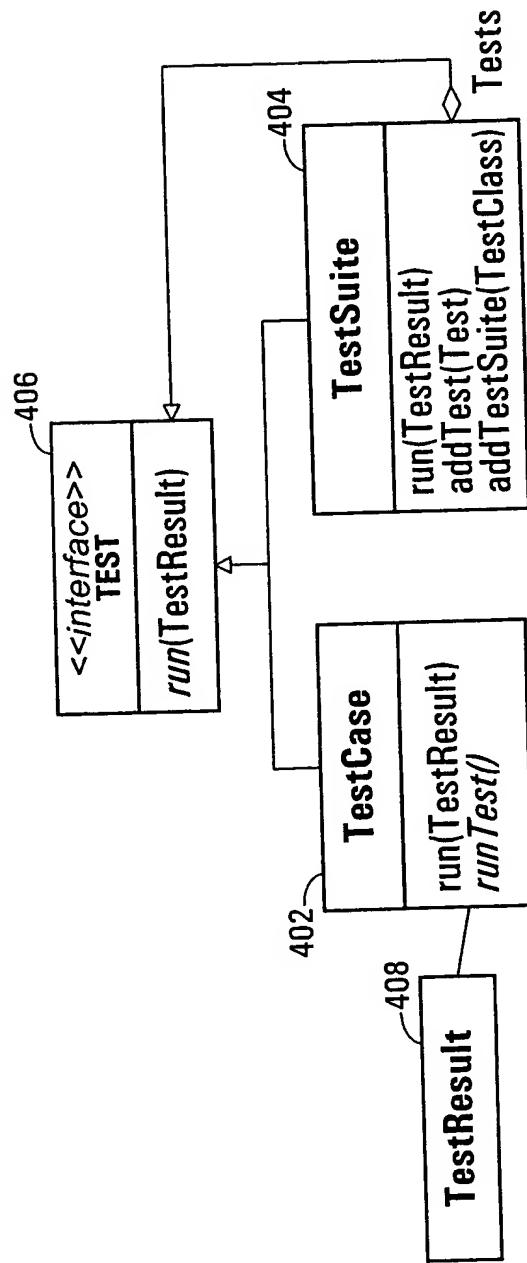


FIG. 4

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Time: 0.02 Failures: 502

There were 2 failures: 502

1) B(tests2.T1)junit.framework.AssertionFailedError: Error introduced
at a specific context of the test B
at tests2.T1.B(T1.java:59)
at junit.extensions.TestDecorator.basicRun(TestDecorator.java:22)
at junit.extensions.TestDecorator.run(TestDecorator.java:28)
at junit.extensions.RepeatedTest.run(RepeatedTest.java:25)
at tests2.TS.main(TS.java:52)

2) C(tests2.T1)junit.framework.AssertionFailedError: Error introduced
at a specific context of the test C
at tests2.T1.C(T1.java:70)
at junit.extensions.TestDecorator.basicRun(TestDecorator.java:22)
at junit.extensions.TestDecorator.run(TestDecorator.java:28)
at junit.extensions.RepeatedTest.run(RepeatedTest.java:25)
at tests2.TS.main(TS.java:52)

FAILURES!!
Tests run: 29, Failures: 2, Errors: 0 502

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FIG. 5

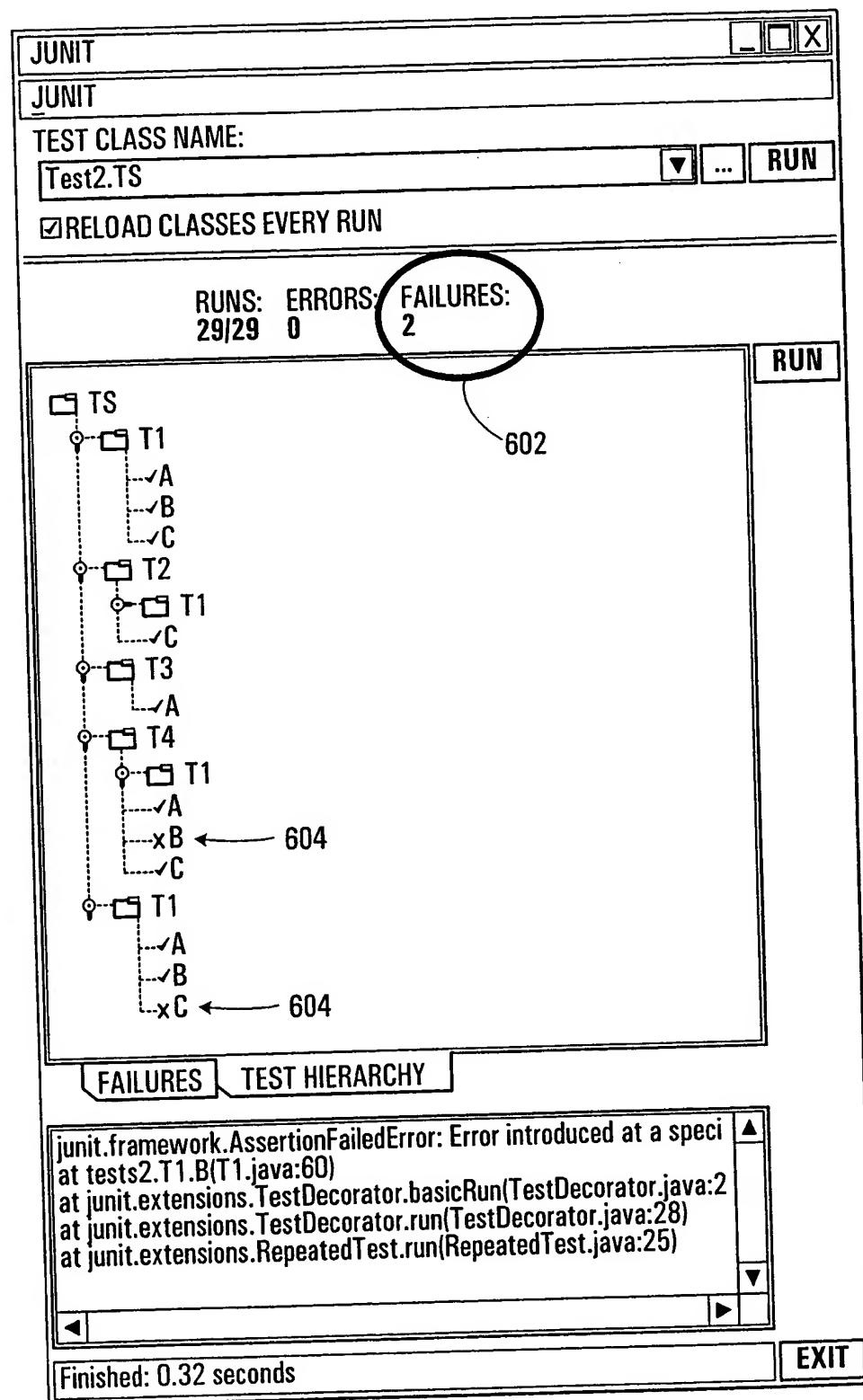


FIG. 6

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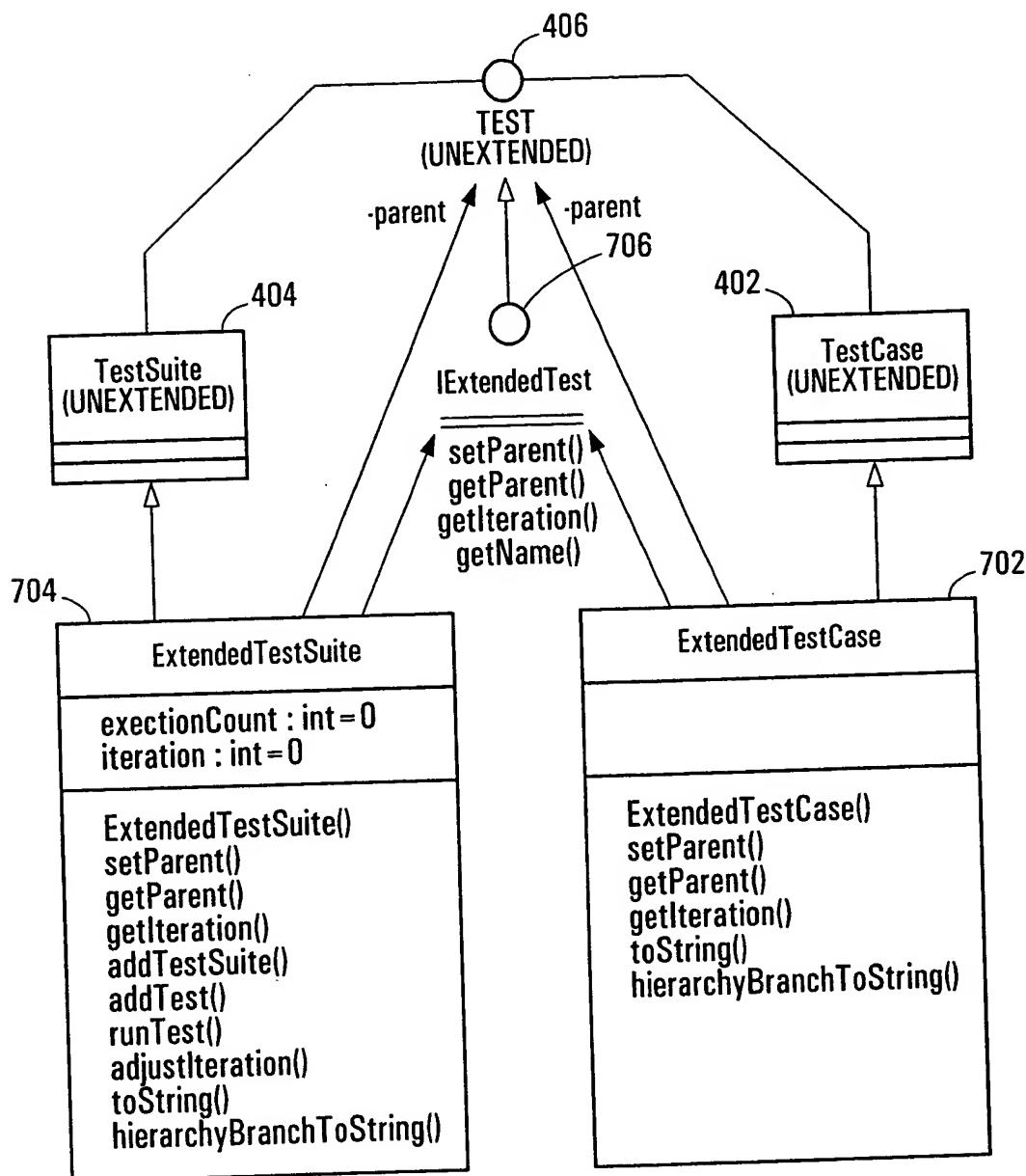


FIG. 7

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```
1 package junit;
2
3 import junit.framework.Test;
4
5 interface IExtendedTest
6 extends Test
7 {
8     public void setParent(Test parent); ← 802
9
10    public Test getParent(); ← 804
11
12    public int getIteration(); ← 806
13
14    public String getName(); ← 808
15
16    public String toJUnitString(); ← 810
17 }
```

FIG. 8

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```
1 package junit;
2
3 import junit.extensions.TestDecorator;
4 import junit.framework.Test;
5 import junit.framework.TestResult;
6 import junit.framework.TestSuite;
7
8 class ExtendedTestSuite
9 extends TestSuite implements IExtendedTest
10 {
11     private Test parent;
12
13     private int iteration = 0;
14     private int executionCount = 0;
15     private int previousParentIteration = 0;
16
17     public void setParent(Test parent) } 902
18     {
19         this.parent = parent;
20     }
21
22     public Test getParent() } 904
23     {
24         return parent;
25     }
26
27     public int getIteration() } 906
28     {
29         return iteration;
30     }
31
32     public void addTestSuite(Class testClass) } 908
33     {
34         addTest(new ExtendedTestSuite(testClass));
35     }
36
37     public void addTest(Test test)
38     {
39         super.addTest(test);
40
41         if (test instanceof TestDecorator)
42             test = ((TestDecorator) test).getTest();
43
44         if (test instanceof IExtendedTest)
45         {
46             IExtendedTest extendedTest =
47             (IExtendedTest) test;
48             extendedTest.setParent(this);
49         }
50
51     public void runTest(Test test, TestResult result) } 912
52     {
53         adjustIteration();
54         super.runTest(test, result);
55     }
56
57 }
```

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FIG. 9A

```
58     protected void adjustIteration()
59     {
60         if((parent != null) && (parent instanceof
61             IExtendedTest))
62         {
63             int parentIteration =
64             ((IExtendedTest)parent).getIteration();
65             if(parentIteration != previousParentIteration)
66             {
67                 executionCount = 0;
68                 previousParentIteration =
69                 parentIteration;
70             }
71             executionCount++;
72             iteration = ((int) (executionCount /
73                 this.testCount())) + 1;
74             if((executionCount % this.testCount()) == 0)
75                 iteration--;
76         }
77         public String toJUnitString()
78         {
79             return super.toString();
80         }
81         public String toString()
82         {
83             return hierarchyBranchToString(this);
84         }
85         protected String hierarchyBranchToString(Test test)
86         {
87             if ((test != null) && (test instanceof
88                 IExtendedTest))
89             {
90                 IExtendedTest extendedProvider =
91                 (IExtendedTest) test;
92                 String hierarchy =
93                 hierarchyBranchToString(extendedProvider.getParent());
94                 if(hierarchy.length() > 0)
95                     hierarchy = hierarchy + ">";
96                 hierarchy = hierarchy +
97                 extendedProvider.getName();
98                 if(extendedProvider.getIteration() > 0)
99                     hierarchy = hierarchy + "_" +
100                     extendedProvider.getIteration();
101
102                 return hierarchy;
103             }
104             if(test != null)
105                 return "?>" + test.toString();
106         }
107     }
```

FIG. 9B

1 package junit;
2
3 import junit.framework.Test;
4 import junit.framework.TestCase;
5
6 class ExtendedTestCase
7 extends TestCase implements IExtendedTest
8 {
9 private Test parent;
10
11 /**
12 * Constructor for JUnitTestCase.
13 * @param name
14 */
15 public ExtendedTestCase(String name)
16 {
17 super(name);
18 }
19
20 public void setParent(Test parent) }1002
21 {
22 this.parent = parent;
23 }
24
25 public Test getParent() }1004
26 {
27 return parent;
28 }
29
30 public int getIteration()
31 {
32 if((parent != null) && (parent instanceof
33 ExtendedTestSuite))
34 return ((ExtendedTestSuite)
35 parent).getIteration();
36 return -1;
37 }
38
39 public String toJUnitString()
40 {
41 return super.toString();
42 }
43
44 public String toString()
45 {
46 return hierarchyBranchToString(this);
47 }
48
49 protected String hierarchyBranchToString(Test test)

FIG. 10A

```
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50      if ( (test != null) && (test instanceof IExtendedTest) )
51      {
52          IExtendedTest extendedProvider = (IExtendedTest) test;
53          String hierarchy =
54              hierarchyBranchToString(extendedProvider.getParent());
55          if(hierarchy.length() > 0)
56              hierarchy = hierarchy + ">";
57          hierarchy = hierarchy + extendedProvider.getName();
58          if(extendedProvider.getIteration() > 0)
59              hierarchy = hierarchy + "_" + extendedProvider.getIteration();
60
61          return hierarchy;
62      }
63
64      if(test != null)
65          return "?>" + test.toString();
66
67      return "";
68  }
69 }
```

FIG. 10B

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Time: 0.02

There were 2 failures:

1) TS 1>T4 5>T1 5>B 5>B junit.framework.AssertionFailedError: Error
 introduced at a specific context of the test B

at extended.Tests2.T1.B(T1.java:61)
 at extended.ExtendedTestSuite.runTest(ExtendedTestSuite.java:114)
 at extended.ExtendedTestSuite.runTest(ExtendedTestSuite.java:114)
 at junit.extensions.TestDecorator.basicRun(TestDecorator.java:22)
 at junit.extensions.TestDecorator.run(TestDecorator.java:28)
 at junit.extensions.RepeatedTest.run(RepeatedTest.java:25)
 at extended.ExtendedTestSuite.runTest(ExtendedTestSuite.java:114)
 at extended.Tests2.TS.main(TS.java:54)

2) TS 1>T1 2>C 2>B junit.framework.AssertionFailedError: Error introduced
 at a specific context of the test C

at extended.Tests2.T1.C(T1.java:72)
 at extended.ExtendedTestSuite.runTest(ExtendedTestSuite.java:114)
 at junit.extensions.TestDecorator.basicRun(TestDecorator.java:22)
 at junit.extensions.TestDecorator.run(TestDecorator.java:28)
 at junit.extensions.RepeatedTest.run(RepeatedTest.java:25)
 at extended.ExtendedTestSuite.runTest(ExtendedTestSuite.java:114)
 at extended.Tests2.TS.main(TS.java:54)

FAILURES!!

Tests run: 29, Failures: 2, Errors: 0

FIG. 11

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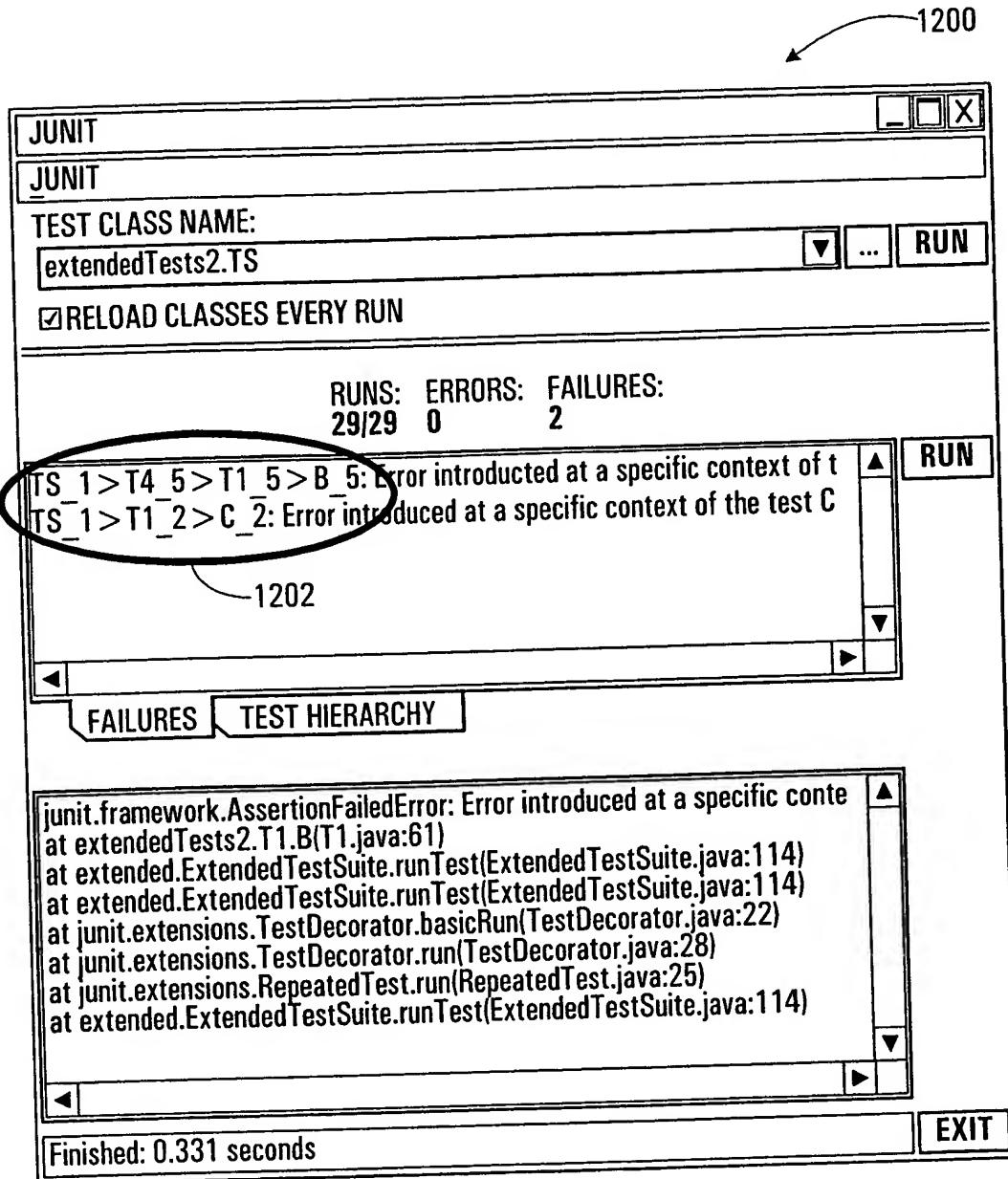


FIG. 12